

REMARKS

The Applicant has now had an opportunity to carefully consider the comments set forth in the Office Action that was mailed May 12, 2010. The indication that **claims 6-8** include allowable subject matter and the acknowledgement of the persuasiveness of the Applicants' arguments are noted with appreciation. Nevertheless, all of the new and repeated grounds of rejection are respectfully traversed. Re-examination and reconsideration are respectfully requested.

The Office Action

In the Office Action that was mailed May 12, 2010:

claims 6-8 were identified as including allowable subject matter;

arguments presented in the paper filed February 4, 2010 with respect to **claims 1, 9** and **4-8** were acknowledged as being persuasive; and

claims 1, 2, 4, 5 and **9** were rejected under 35 USC §103(a) as allegedly being obvious in view of U.S. Patent No. 5,818,539 to Lennen ("Lennen") in view of U.S. Patent Application Publication No. 2003/0081659 A1 by Yousef et al. ("Yousef").

The Present Application

By way of brief review, the present application is directed toward methods for validating the detection of a correlation peak detected between a signal transmitted by a plurality of navigation satellites and a local replica generated by a receiver, said replica being of a spread spectrum signal characteristic of a particular satellite. The method includes comparing a determined correlation function with a theoretical autocorrelation function over the whole of the vector of the correlation function. For instance, once a main peak has been detected in a correlation function, a verification is performed that compares the correlation function obtained from the received signal with the theoretical autocorrelation function for the particular satellite signal. The main peak corresponds to the highest peak of the calculated correlation function. In practice, detecting the main peak of the correlation function enables an assumed synchronization time to be determined. The theoretical autocorrelation function is calculated to obtain a main peak centered on the synchronization time. The two functions therefore have a main peak

around the assumed synchronization time. The two functions also have **secondary peaks** or lobes. **By comparing the secondary peaks**, that is to say by verifying, for example, whether they occur at the same time, a deduction is made with regard to whether the detected main peak is in fact associated with the satellite that is being looked for (paragraph 20).

The Cited Documents

In stark contrast, the primary reference of the Office Action to **Lennen does not disclose** comparing a correlation function with a theoretical autocorrelation function as a function of time of spread spectrum signal over the whole of the vector of the correlation function. For example, Lennen **does not disclose or suggest** comparing secondary peaks (e.g., compare the depiction of secondary peaks 5 and 7 in Fig. 1 of the present application to any of Figs 1, 4, 5, 7, 8, 9, 10, or 13 of Lennen). Where **the present application is concerned with identifying the satellite** associated with the signal, Lennen is concerned with characterizing multipath induced distortions in an autocorrelation function of a correlation receiver in order to reduce effects of these multipath induced distortions on the accuracy of detecting the time of arrival of a signal (Abstract).

Like Lennen, the secondary reference of the Office Action to **Yousef** is concerned with problems associated with overlapping multipath components. That is, Yousef allegedly describes a method and apparatus that provides an accurate estimate of the time and amplitude of the arrival of the first arriving overlapping multipath components in wireless locating finding systems (Abstract). Accordingly, Yousef is not concerned with validating the detection of a correlated peak and **does not disclose or suggest** comparing a correlation function with a theoretical autocorrelation function in a process which includes comparing secondary peaks of each of said functions. For example, as explained at paragraph 39 of Yousef, cited Figs. 1 and 2 of Yousef show combined impulses of a two ray channel and a conventional pulse-shape and do not disclose or suggest the comparison recited in, for example, **claim 1** of the present application. Furthermore, cited Figs. 1 and 2 do not depict correlations or autocorrelation functions associated with satellite signals. Instead, as explained at

paragraph 39, Fig. 1 and Fig. 2 show the combined impulse of a two ray channel and a conventional pulse-shape, for a CDMA IS-95 system in two cases. In Fig. 1, the delay between the two channel rays is equal to twice the chip duration. In Fig. 2, both multipath components overlap and are non-resolvable by means of a peak-picking procedure. As further indicated in paragraph 39, Fig. 1 makes it clear that the illustrated peaks of both rays are resolvable, thus allowing relative accurate estimation of the prompt ray time and amplitude of arrival. In contrast, paragraph 39 indicates that the situation depicted in Fig. 2 can lead to significant errors in the prompt ray time and amplitude of arrival estimation. Accordingly, cited Figs. 1 and 2 explain the problem being addressed by Yousef and **do not disclose or suggest** a method for validating a peak including a comparison of a correlation function and an autocorrelation function.

For at least the foregoing reasons, **claims 1, 2, 4, 5 and 9** are not anticipated and are not obvious in view of Lennen.

The Claims Are Not Obvious

Claims 1, 2, 4, 5 and 9 were rejected under 35 USC §103(a) as allegedly being obvious over Lennen in view of Yousef.

In an effort to explain the rejection of **claims 7 and 9**, the Office Action stipulates that Lennen **does not disclose** a method of validating the detection of a correlation peak between a signal transmitted by a plurality of navigation satellites and a local replica, the method being characterized in that it further includes a step of comparing said correlation function with a theoretical autocorrelation function as a function of time of said spread spectrum signal characteristic of said satellite that is being looked for over the whole of the vector of the correlation function wherein comparing said correlation function with the theoretical autocorrelation function includes a step of comparing **secondary peaks** of each of said functions.

In an effort to compensate for this defect, the Office Action relies on paragraphs 96 and 97 and Figs. 1 and 2 of Yousef.

However, Yousef is not concerned with signals transmitted by a plurality of navigation satellites. Accordingly, Yousef **does not disclose or suggest** any method of validating the detection of a correlation peak between a signal transmitted by a

plurality of navigation satellites and a local replica generated by a receiver. **Instead**, Yousef discusses a method for identifying the first ray to arrive from a plurality of rays received from a CDMA transmitter so that the effects of overlapping multi-path signals from the CDMA transmitter can be mitigated. For example, paragraph 95 of Yousef indicates that a common structure for CDMA channel estimation is to correlate the received signal with a delayed replica of known pulse-shaped code sequence over a dense grid of possible values of delay. This correlation is done over a period of N samples of the received sequence. In this regard, it is noted that paragraph 95 **does not indicate** that the N samples include the whole vector of a correlation function as is recited in claim 1. Moreover, paragraph 95 does not refer to the comparison of a correlation function with a theoretical autocorrelation function as is recited in **claim 1**. Still further, even if paragraph 95 could be construed as disclosing the comparison of a correlation function with a theoretical autocorrelation function, paragraph 95 **does not disclose or suggest** that comparing said correlation function with the theoretical autocorrelation function includes a step of comparing secondary peaks of each of said functions as is recited in **claim 1**. It is noted that paragraph 95 introduces cited paragraphs 96 and 97.

Paragraph 96 indicates that if the channel has only one ray, there is no problem as it is well known that this function attains a maximum at a specific value of delay which is equal to the time of arrival of this single ray. Cited paragraph 96 also indicates that, if the channel has more than one ray, the output of the correlation can have more than one peak. It is respectfully submitted that this is a reference to the situations depicted in cited Fig. 1 and Fig. 2 of Yousef. As indicated in the keys to those Figures, the prompt ray is depicted with a dashed line, and an overlapping ray is depicted with a dotted line. It is respectfully submitted that each of the two depicted signals (prompt and overlapping) clearly include a major peak and several minor peaks. Since, for example, cited paragraph 96 indicates that if the channel has more than one ray, then the output of the correlation can have more than one peak, Yousef refers only to the major peak of any one signal and does not consider the minor peaks depicted in cited Fig.1 and Fig. 2. Since Yousef is not concerned with the minor ripples depicted in Fig. 1 and Fig. 2, it is respectfully submitted that the assertion of the Office Action that Yousef

includes a step of comparing secondary peaks of each of said functions represents a **clear error** of the Office Action. It is respectfully submitted that Yousef **does not disclose or suggest** comparing secondary peaks.

For at least the foregoing reason, **claims 1 and 9** are not anticipated and are not obvious in light of Lennen and Yousef.

Furthermore, cited paragraph 97 can only be construed as teaching away from the subject matter of the present application at least in certain circumstances. For example, paragraph 97 asserts that for the case of fading channels, the correlation operation, described above, **cannot be extended for the whole length of the received sequence** as this would cause the correlation output to degrade due to the random variations of the fading channel phase.

For at least the foregoing additional reasons, **claims 1, 2, 4, 5 and 9** are not anticipated and are not obvious in view of Lennen and Yousef.

Additionally, the Office has not met its burden of presenting a *prima facie* case of obviousness. For example, in this regard, the Office Action asserts that it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the disclosure of Lennen in order to incorporate the multi-path condition processing provided by the disclosure of Yousef to allow for accurate position validation.

However, incorporating the multi-path condition processing of Yousef would not arrive at the subject matter of **claims 1 and 9**. **Claims 1 and 9** are directed at validating that a received signal is from a satellite that the signal is believed to be from or validating that a received signal is from a particular satellite and **claims 1 and 9** are not concerned with multi-path condition processing. Furthermore, the processing of Yousef is of CDMA signals and **not** satellite-based positioning signals.

Still yet further, it is respectfully submitted that Lennen does not suggest that any improvement in the method of Lennen is necessary. It is respectfully submitted that Lennen asserts that the method of Lennen provides accurate positioning and does not indicate a need for the “accurate positioning validation” that the Office action asserts would be provided by including subject matter from Yousef. It is respectfully submitted that the only motivation for modifying the method of Lennen in the suggested manner is information gleaned from the present application. Accordingly, the rejection of **claims 1**

and **9** based on the suggested combination of Lennen and Yousef is based on **impermissible hindsight reasoning**.

For at least the foregoing additional reasons, **claims 1** and **9**, as well as **claims 2, 4** and **5**, which depend from **claim 1**, are not anticipated and are not obvious in light of Lennen and Yousef.

Claim 2 depends from **claim 1** and is not anticipated and is not obvious for at least that reason.

With regard to **claim 4**, the Office Action cites paragraphs 96 and 97 of Yousef.

However, the cited paragraphs discuss a correlation between a received signal with a delayed replica of a known pulse-shaped code sequence. It is respectfully submitted that cited paragraphs 96 and 97 **do not disclose or suggest a theoretical autocorrelation function or a comparison between such a theoretical autocorrelation function** and a correlation as a function of time between a received signal and a local replica as is recited in **claims 1** and **9** of the present application.

Claim 5 depends from **claim 1** and is not anticipated and is not obvious in light of Lennen and Yousef for at least that reason.

Comments on Statements of Reasons for the Indication of Allowable Subject Matter

The indication of allowable subject matter in **claims 6-8** is noted with appreciation. While the Applicant agrees that the claims are allowable, the Applicant does not necessarily agree that the claims are allowable only for the precise reason indicated in the Office Action

Telephone Interview

In the interests of advancing this application to issue the Examiner is invited to telephone the undersigned to discuss the foregoing or any suggestions that the Examiner may have to place the case in condition for allowance.

CONCLUSION

Claims 1, 2 and 4-9 remain in the application. For at least the foregoing reasons, the application is in condition for allowance. Accordingly, an early indication thereof is respectfully requested.

☒ Remaining Claims, as delineated below:

(1) FOR	(2) CLAIMS REMAINING AFTER AMENDMENT LESS HIGHEST NUMBER PREVIOUSLY PAID FOR		(3) NUMBER EXTRA
TOTAL CLAIMS	8	- 20 =	0
INDEPENDENT CLAIMS	2	- 3 =	0

☒ Applicants hereby petition the Commissioner under 37 C.F.R. § 1.136(a) and request a **one- month extension of time** to respond to the outstanding Office Action.

☒ This is an authorization under 37 CFR 1.136(a)(3) to treat any concurrent or future reply, requiring a petition for extension of time, as incorporating a petition for the appropriate extension of time.

☒ The Commissioner is hereby authorized to charge any filing or prosecution fees which may be required, under 37 CFR 1.16, 1.17, and 1.21 (but not 1.18), or to credit any overpayment, to Deposit Account Number 06-0308.

Respectfully submitted,

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Date

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